UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,452	09/12/2003	Yongsheng Liu	AVA-P013	7807

47389 7590 02/24/2005

MOSER, PATTERSON & SHERIDAN, LLP
AVANEX CORPORATION
3040 POST OAK BLVD
SUITE 1500
HOUSTON, TX 77056

EXAMINER	
CURTIS, CRAIG	

ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 02/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/661,452	LIU ET AL.	
	Examiner	Art Unit	
	Craig Curtis	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter that Applicants regard as their invention.

1. Claims 7 & 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicants regard as their invention. More specifically, proper antecedent support has not been provided for the limitation "...***the*** remaining express channels... (emphasis added)" recited in each of these claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cao et al. (US 6,493,141 B2) in view of Yao (US 6,687,423 B1).

With regard to claims 1 and 12, Cao et al. disclose the invention as claimed, in pertinent part—[a] reconfigurable channel dropping de-multiplexer [see, e.g., Fig. 5b], comprising (among other things):

an input [viz., λ_1–λ_n];

a first polarizing port [i.e., 116d] optically coupled to the input [see Fig. 5b];

a first polarization modulator coupled to the first polarizing port [202 or 204];

a polarization beam splitter (PBS) [104] having a first side that is optically coupled to the first polarization modulator at a side opposite to the first polarizing port [see Fig. 5b];

a second polarizing port [see, e.g., 116b] optically coupled to the second polarization modulator at a side opposite to the PBS; and

a multiple-channel output [see λ'_2, λ'_4, λ'_6, etc., issuing from said second polarizing port 116b] optically coupled to the second polarizing port; and a

a second polarization modulator [106 or 108] optically coupled to the PBS at a second side of the PBS—**EXCEPT FOR** an express teaching wherein said second side of the PBS is opposite to said first side.

Yao, et al., however, expressly disclose a reconfigurable channel dropping de-multiplexer [see, e.g., 601 in Fig. 6A] comprising (among other things) a first polarization modulator [viz., 130A) optically coupled to a first port [viz., through which input 110 is provided] and a second polarization modulator [viz., 130B] optically coupled to the PBS [see Fig. 6A] at a side opposite to said first side. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the invention of Cao et al. such that its second polarization modulator be optically coupled to the PBS at a second side of the PBS, said second side of the PBS being opposite to said first side, as taught by Yao et al., for at least the purpose of effecting desired polarization states on light transiting said reconfigurable channel dropping de-multiplexer.

With regard to claims 2 & 3 and 13 & 14, the combination further teaches wherein a first quarter-wave ($\lambda/4$) plate and a second quarter-wave ($\lambda/4$) plate are optically coupled to the PBS a third side of the PBS that is not parallel to either of the first two sides [cf., e.g., 616, 106, 202 in Fig. 6h of Cao et al.], and a second quarter-wave ($\lambda/4$) plate optically coupled to the PBS at a fourth side of the PBS that is not parallel to either of the first two sides [id.], and with specific reference to the recited mirror optically coupled to the second $\lambda/4$ plate at a side opposite to the PBS, please see 670 in Fig. 6h of Cao et al.].

With regard to claim 4, the combination further discloses an optical channel band pass filter optically coupled to the first $\lambda/4$ plate at a side opposite to the PBS. Please see band pass filter 610 in Fig. 6A of Yao, the provisioning of such filters being an obvious design choice to one having ordinary skill in the multiplexing art, for at least the purpose of effecting desired channel selection.

With regard to claim 5, the combination further teaches a third $\lambda/4$ plate at a side opposite to the first $\lambda/4$ plate. Please see, e.g., Fig. 6h in **Cao et al.**

With regard to claims 6 and 15, the combination discloses wherein said de-multiplexer of claims 5 and 12 further comprises:

a third polarizing port optically coupled to the third $\lambda/4$ plate at a side opposite to the optical channel band pass filter [see Fig. 6h]; and

a single-channel output optically coupled to the third polarizing port [id., 116a].

With regard to claim 7, the combination discloses wherein a de-multiplexer of claim 6 that can function in a first operational state, wherein the first and second polarization modulators are configured so as to rotate the orientation of plane polarized light by 90 degrees; and wherein

the input receives and directs a plurality of optical channels to both the second polarizing port and the third polarizing port such that a single dropped channel is routed to the third polarizing port and such that the remaining express channels are routed to the second polarizing port. See, e.g., Fig. 6h in Cao et al. and Fig. 6A in Yao.

With regard to claim 8, the combination discloses de-multiplexer of claim 6 that can functioning in a second operational state, wherein the first and the second polarization modulators are configured so as to not change the polarization plane orientation of plane polarized light; and wherein the input receives and directs a plurality of optical channels to the second polarizing port and no optical channels are directed to the third polarizing port. Please see, in particular, column 17, lines 14-19.

With regard to claims 9 & 18, the combination further discloses wherein the de-multiplexer of claim 1 further comprises an isolator core optically coupled to the PBS at a third side of the PBS that is not parallel to either of the first two sides. Please see Fig. 10B in Yao, the cascading drop filters providing, in a functional sense, an isolator core.

With regard to claim 10, the combination further discloses wherein the de-multiplexer of claim 4, wherein the optical channel band pass filter comprises a thin film band pass filter. Please see the aforementioned band pass filter 610 in Fig. 6A of Yao; also see column 7, lines 57-59 in Yao.

With regard to claim 11, the combination further discloses wherein the de-multiplexer of claim 6 can operate as a channel adding multiplexer [see Abstract in Cao et al.], wherein the multiple-channel output serves as a multiple-channel input for receiving a plurality of express channels, the single-channel output serves as a single-channel input, the input serves as an

output, and the multiple-channel input is combined with the single-channel input to the output. See, e.g., Fig. 6h in Cao et al. in light of the modifying teachings of the combination motivated by Fig. 6A of Yao.

With regard to claims 16-18, the combination expressly discloses, inter alia, wherein a plurality of optical channels λ_1–λ_n pass through said re-configurable channel dropping de-multiplexer from the first polarizing port to both the second polarizing port and the third polarizing port such that a single dropped channel λ_d is routed to the third polarizing port and the remaining express channels are routed to the second polarizing port. See above, especially Fig. 6h in Cao et al. & Fig. 6A in Yao.

With regard to claim 19, Cao et al. expressly disclose the claimed invention **EXCEPT FOR** an explicit teaching of a cascaded re-configurable system having two or more re-configurable channel dropping de-multiplexers. **Yao**, however, explicitly discloses a cascaded re-configurable channel dropping de-multiplexing scheme. Please see Fig. 10B therein. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the invention of **Cao et al.** such that it comprise a cascaded re-configurable channel dropping de-multiplexer, as taught by **Yao**, for at least the purpose of providing increased functionality vis-à-vis channel selection.

Contact Information

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig Curtis, whose telephone number is (571) 272-2311. The examiner can normally be reached on Monday-Friday, 9:00 A.M. to 6:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A. Dunn, can be reached at (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C.H.C.
Craig H. Curtis
Group Art Unit 2872
17 February 2005

Audrey Chang
Primary Examiner
Technology Center 2800